NON-PUBLIC?: N
ACCESSION #: 8903300185
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Pilgrim Nuclear Power Station PAGE: 1 OF 4

DOCKET NUMBER: 05000293

TITLE: Loss of Preferred Offsite Power Due to Failed Feeder Cable
EVENT DATE: 02/21/89 LER #: 89-010-00 REPORT DATE: 03/20/89

OPERATING MODE: N POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. L. Cannon - Senior Compliance Engineer TELEPHONE: 508 747-8321

COMPONENT FAILURE DESCRIPTION:
CAUSE: B SYSTEM: EA COMPONENT: CBL MANUFACTURER: K080
REPORTABLE TO NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On February 21, 1989, at 0100 hours, a loss of preferred offsite power occurred that resulted in an automatic start of the "A" and "B" Emergency Diesel Generators, a primary and secondary containment isolation signal, and an automatic actuation of the Reactor Protection System (full scram signal).

The cause of the loss of preferred offsite power was due to actuation of the Startup Transformer differential ground current relay on a fault which tripped lockout relay 186-4. Actuation of the lockout relay tripped the 345KV Switchyard Air Circuit Breakers (ABCs) No. 102 and No. 103. The fault occurred on a "C" phase power feeder cable between the secondary of the Startup Transformer and the Auxiliary Power Distribution System. The cause of the cable failure could not be determined with certainty due to the nature of the cable damage. However, preliminary examination indicates that the failure may be related to cable jacket damage during original cable installation (c. 1970). The cable was manufactured by the Kerite Company and is a 1250 MCM, 5KV, 1/conductor, stranded, lead alloy coated copper, HT Kerite insulated cable with an FR jacket. Corrective action taken included replacement of approximately 100 feet of the failed cable and sending the failed cable to the

manufacturer for further examination.

This event occurred while in cold shutdown with the reactor mode selector switch in the "REFUEL" position for instrumentation panel checks and with all control rods fully inserted. The Reactor Vessel (RV) water temperature was less than 212 degrees Fahrenheit and the RV pressure was zero psig. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv). This event nosed no threat to the health and safety of the public.

END OF ABSTRACT

EVENT DESCRIPTION

On February 21, 1989, at 0100 hours, Switchyard Air Circuit Breakers (ACBs) No. 102 and No. 103 automatically tripped open resulting in a loss of the preferred offsite power source. As a result of the loss of power, the "A" and "B" Emergency Diesel Generators (EDGs) automatically started and provided electrical power to the emergency electrical buses A-5 and A-6. The loss of power also resulted in automatic actuations of portions of the Primary Containment Isolation Control System (PCIS), Reactor Building Isolation Control System (RBIS), and Reactor Protection System (RPS).

The actuations resulted in a full scram signal, isolation of the Reactor Water Cleanup (RWCU) System, automatic closing of the Secondary Containment System (SCS) supply and exhaust ventilation dampers (Trains "A" and "B"), and the automatic start of the "A" and "B" trains of the SCS/Standby Gas Treatment System (SGTS). These actuations were expected designed responses to the loss of preferred offsite power.

On February 21, 1989, at 0148 hours, the PCIS logic circuitry was reset and the RWCU System was returned to service. At 0238 hours the scram signal was reset. The RBIS logic circuitry was reset, the SCS supply and exhaust dampers were reopened, and the SCS/SGTS was returned to normal standby service.

Failure and Malfunction Report 89-84 was written to document the event. The NRC Operations Center was notified at 0152 hours on February 21, 1989.

The event occurred while in cold shutdown with the reactor mode selector switch in the "REFUEL" position for instrumentation panel checks. The control rods were in the inserted position and remained in the inserted position. The Reactor Vessel (RV) water temperature was less than 212 degrees Fahrenheit and the RV pressure was zero psig. The reactor power level was zero percent.

CAUSE

Investigation into the cause for the tripping of ACBs No. 102 and No. 103 determined that a Startup Transformer lockout occurred because of a power cable fault detected by the differential ground current relay. Actuation of the differential ground current relay tripped lockout relay 186-4 that caused ACBs No. 102 and No. 103 to open. Megger testing and High-Potential testing identified a ground fault in the underground portion of one of the "C" phase power feeder cables between the secondary side ("X" winding) of the Startup Transformer and a nonsafety-related 4160 " C Bus (A-4) of the Auxiliary Power Distribution System (APDS).

The cause of the cable failure could not be determined with certainty due to the nature of the cable damage. However, preliminary examination indicates that the failure may be related to cable jacket damage during original cable installation (c. 1970). The failed section of cabling has been shipped to the cable manufacturer (Kerite) for further examination. A supplement to this report will be submitted if the manufacturer's examination reveals significant information regarding the cable failure. The cable was manufactured by the Kerite Company and is a 1250 MCM, 5KV, 1/conductor, stranded, lead alloy coated copper, HT Kerite insulated cable with an FR jacket.

CORRECTIVE ACTION

On February 21, 1989, at 0450 hours, actions commenced to lineup the 345 KV offsite power source by backfeeding through the Main and Auxiliary Transformer. This lineup was accomplished in accordance with Procedure 3.M.3-9 "Phase Bus Quick Disconnected Links Removal/Main and Unit Auxiliary Transformer Backscuttling". At 1605 hours the Unit Auxiliary Transformer was placed in service in the backfeed mode and at 1620 hours, off-site power was restored to the APDS. At 1645 hours, the "B" EDG was secured, and at 1650 hours the "A" EDG was secured.

The failed section of the cable was replaced and the remaining 11 feeder cables from the "X" winding of the Startup Transformer were tested. The failed section of cable was replaced by splicing in a new section (approximately 100 feet) of cable. Following installation, the cable was satisfactorily tested. The remaining eleven (11) feeder cables were also meggered and High-Potential tested. This testing did not identify any other fault in the cables.

On February 27, 1989, at 2318 hours, the Startup Transformer was re-energized. On February 28, 1989, at 0600 hours the APDS was re-energized by the preferred offsite power source.

SAFETY CONSEQUENCES

This event posed no threat to the health and safety of the public.

The affected systems responded as designed to the loss of the preferred offsite power source. The EDGs (standby AC power source) automatically started and supplied power to the emergency electrical buses A-5 and A-6. Appropriate actions were taken in accordance with approved station operating procedures and the plant remained in a stable and cold shutdown condition.

The temporary interruption in RWCU System operation is not significant to the safe operation of the plant. Prolonged periods without RWCU System operation can lead to degraded reactor water chemistry and subsequent plant shutdown.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv) because of the start of the EDGs, and the actuation of the PCIS, RBIS and RPS logic circuitry.

SIMILARITY TO PREVIOUS EVENTS

A review was conducted of Pilgrim Station Licensee Event Reports (LERs) submitted since January, 1984, involving a loss of preferred offsite power. This review identified the following LER events:

LER 50-293/86-027-01: On November 19, 1986, Pilgrim Nuclear Power Station was in a cold shutdown/refuel mode when the plant experienced a loss of preferred offsite power during a severe winter storm. Investigation and inspection determined the most probable cause for the loss of offsite 345 KV power to have been ice and snow associated with the storm.

LER 50-293/86-029-00: On December 23, 1986, the Pilgrim Nuclear Power Station was in a cold shutdown/refuel mode when it experienced a loss of preferred offsite power while in the process of washing the on-site 345 KV switchyard insulators. A flashover occurred when overspray from the non-energized insulator being washed reached a nearby energized insulator. The flashover resulted in the trip of the 345 KV line that was supplying power to the Startup Transformer at the time of the event.

LER 50-293/87-005-00: On March 31, 1987, a loss of preferred offsite power occurred during a storm. The plant was in cold shutdown with the Reactor Vessel defueled. Initiating the event was a loss of power of the offsite 345 KV transmission line (#342).

LER 50-293/87-014-01: On November 12, 1987, a loss of preferred offsite power

occurred due to a series of storm related faults in the offsite 345 KV transmission system.

ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) CODES

The EIIS codes for this report are as follows:

COMPONENTS CODES

Cable CBL

SYSTEMS

Reactor Protection System (RPS) JC
Medium Voltage Power System (4.16 KV) EA
Emergency Onsite Power System (EDGs) EK
Engineered Safety Feature Actuation System
(PCIS, RBIS, RPS) JE
Containment Isolation Control System
(PCIS & RBIS) JM
Standby Gas Treatment System BO
Reactor Water Cleanup (RWCU) System CE

ATTACHMENT 1 TO 8903300185 PAGE 1 OF 1

10CFR50.73

BOSTON EDISON
Pilgrim Nuclear Power Station
Rocky Hill Road
Plymouth, Massachusetts 02360

Ralph G. Bird
Senior Vice President - Nuclear

March 20, 1989

BECo Ltr 89-038

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Docket No. 50-293
License No. DPR-35

Dear Sir:

The attached Licensee Event Report (LER) 89-010-00, "Loss of Preferred Offsite Power Due to Failed Feeder Cable" is submitted in accordance with 10 CFR Part 50.73.

Please do not hesitate to contact me if there are any questions regarding this report.

R. G. Bird

RLC/bjh

Enclosure: LER 89-010-00

cc: Mr. William Russell
Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Rd.
King of Prussia, PA 19406

Sr. NRC Resident Inspector - Pilgrim Station

Standard BECo LER Distribution

*** END OF DOCUMENT ***